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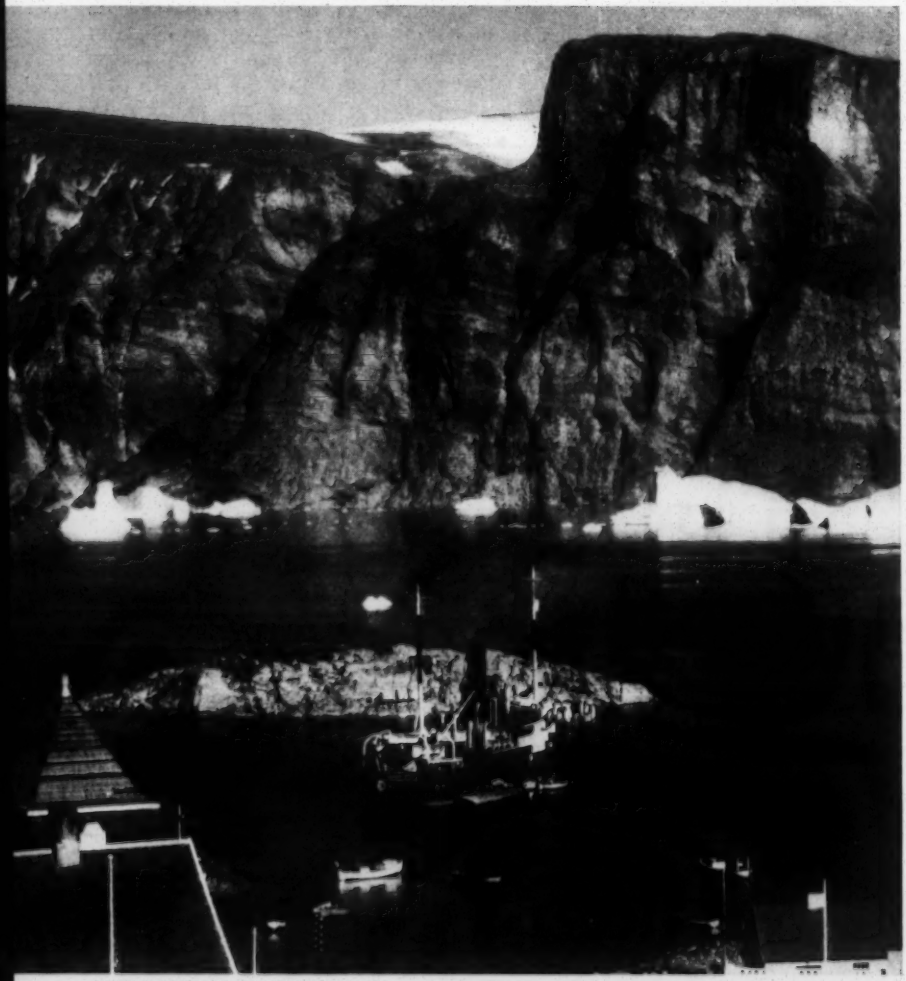

ANDREW H. BROWN, NATIONAL GEOGRAPHIC STAFF

DANISH STEAMER pays its yearly call at berg-dotted Umanak harbor, Greenland

► A Warmer Greenland Molds New Life
► Wetlands Dwindle; Wildlife Fades
► Everglades Drainage Backfires
► Tapping the Salt of the Earth
► Cities, Farms Edge Great Salt Lake

UMI

Now the process is reversed. Most of the seals that were the foundation of Kunuk's life—he got clothing, food, shelter, and his boat from them—have moved north.

The warmer waters now attract schools of cod and other fish (right). But Kunuk cannot wear fish skins.

So money has come to the island. Kunuk sells his fish to buy his clothes.

With the warmer weather, farming has come back. In well-built wooden homes, wives bake bread and churn butter. Hardy vegetables are coaxed from the reluctant soil. Chickens scratch the yard. Livestock—sheep, reindeer, and cows (below)—search for food. A motorboat in a near-by fiord has replaced the kayak for trips to the village.

Other innovations affect the 27,000 Greenlanders. Commercial airliners flying between Scandinavia and the United States stop there for fueling, as Allied bombers did during World War II.

By agreement with Denmark, which owns the island, the United States maintains a major air base at Thule (pronounced TOO-lee), far north on the west coast—the northernmost bastion of the Free World. It guards against transpolar attack.

PHOTOGRAPHS BY ANDREW H. BROWN, NATIONAL GEOGRAPHIC STAFF

Additional changes are in the making.

Beneath the rocky mantle are deposits of coal, copper, wolframite, graphite, and iron. Lead and zinc are exported, along with the Free World's only cryolite, a mineral essential in making aluminum.

One native summed up:

"Business. Business. That's everything. Nobody's interested in the past, in kayaks, dogs, or the old ways."

UMI

BJARNE HENNING-JENSEN, PIX

Greenland Aims at New Life

TENSE AS A COILED spring, Pida Kunuk cocks his throwing arm and aims at a seal.

His country, Greenland, is rushing into new importance with the speed of his swift kayak. It is propelled by a double-bladed paddle labeled "location" and "weather."

The largest island in the world, Greenland lies northeast of Canada—between North America and Europe on the Polar air routes.

Weather holds a double place in the island's life. As Canada serves up weather to much of the United States, Greenland dishes it out to the North Atlantic. Knowledge of storms and air masses moving over the icy vastness is vital to air and sea travel to the south.

Over four-fifths of the island's 840,000 square miles there is nothing green. It is frosted by the second largest icecap in the world (Antarctica's is bigger). So far the cap is useless, except for air fields, weather stations, and ice research (see GSB Vol. 36, pg. 154-6).

Sudden winds and violent storms rage over the ice; snowfall can be expected ten months of the year. Around the edge of this blinding desert, the ice cracks and crumples, pushing its way through gaps in the coastal mountains to shatter into giant icebergs, some as tall as a ten-story building.

But along the southern coast, the bleak picture changes. Gradual warming of the northern hemisphere over the decades has pushed the ice back, leaving an area that resembles what Erik the Red must have found when he arrived with his Vikings back in A.D. 983. The colony of farmers and orchardists he founded disappeared without a trace sometime in the 15th century—perhaps because a cool period brought the ice south and drove the settlers into the sea.

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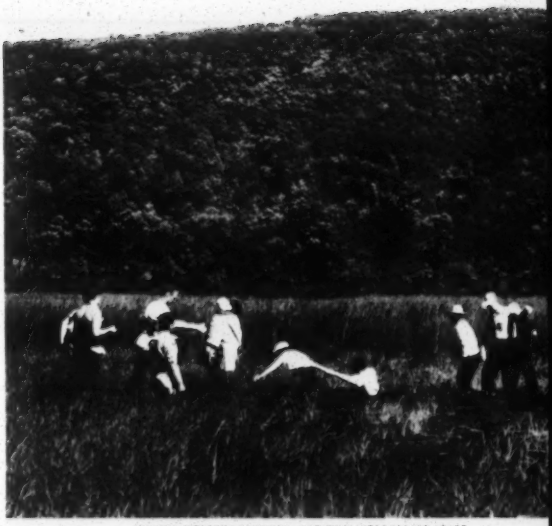
Finding the proper balance between the many possible uses of such areas is not easy. Even the Federal government cannot make up its mind on the problem, and pays farmers to drain land with one hand, while it encourages them to keep the land wet with the other. The Soil Conservation Service offers subsidies for land draining in the Dakotas, Montana, and Minnesota. The Fish and Wildlife Service urges that these marshes be preserved, because they are the nation's best wildfowl nesting grounds. Chief threats to the wetlands today, according to Dr. F. S. Henika of the Fish and Wildlife Service, are:



WALTER MEAYERS EDWARDS, NATIONAL GEOGRAPHIC STAFF

1. Drainage for farming.
2. Flood Control. As rivers such as the Mississippi are corseted with dikes, millions of acres that formerly were flooded each year have become dry farmland.
3. Road building. This takes up an estimated million acres of land each year, some of it wetland. With the new federal highway program, it will increase.
4. Urbanization. Sometimes expanding cities have nowhere to go but into wetlands —although they are seldom the best housing sites.
5. Pollution. Some, such as oil and chemical pollution, kills wildlife outright. Sewage or silt eroded from higher land can strangle food plants. F.S.

BIRDS AND PEOPLE enjoy marshes in central California (below) and upstate New York (above). The muck sloggers are ornithology students from Cornell University.

PETER J. VAN HUIZEN, U.S. FISH AND WILDLIFE SERVICE

UMI

Water Levels Drop, Wildlife Fades as

WETLANDS BECOME DRY

MOTHER RACCOON and her triplets above are lucky 'coons. They live in the Everglades National Park, set aside from the needs and greeds of men to serve as a refuge. Other raccoons, muskrats, and water birds living on unprotected private lands find less space each year available to them.

The swamps and marshes of the United States, with their rich wildlife, and their valuable services in holding water, are drying up.

Much of this is inevitable—a growing human population needs more space for houses, airports, roads, garbage dumps. But much of the destruction of "wetlands" —grassy marsh and wooded swamp—is not necessary.

Scientists with the Fish and Wildlife Service, trying to keep the population of ducks, geese, and other game at useful levels, foresee no reversal of the trend.

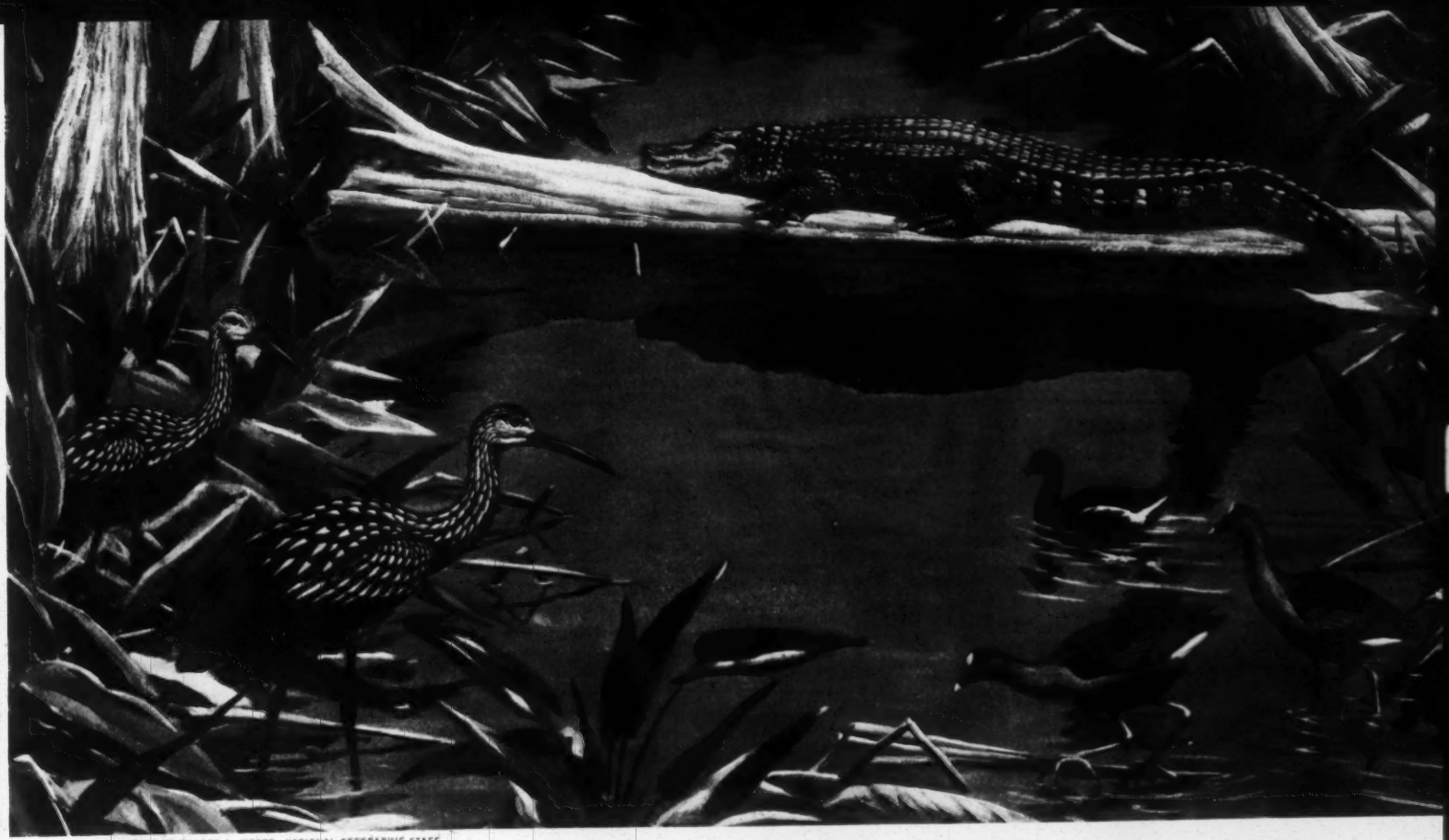
A law passed last year will give the Service more money to buy wildlife-favored land. It raises the federal tax on duck hunters from $2 to $3 and provides that the revenue be used to set aside wetlands that will assure hunters something to hunt.

For as wetlands go, ducks and geese decrease, the sport of the hunter declines, and other serious upsets occur.

Raccoons and muskrats dwindle, and with them the livelihood of the trapper. Turtles, egrets, and kingfishers disappear, and America loses beauty. Millions of persons who delight in seeing wildlife, like the group in Spencer Marsh, New York (below right), are bereft.

Draining swamps also harms water supplies (see next story) which are perhaps our most precious natural resource.

When John Smith and his Englishmen set up their colony on a marshy island in the James River two and a half centuries ago, there were some 127 million acres of wetlands across the country. They produced flocks of birds so large they darkened the sky as they flew. Although the remnants, such as the flocks at the Sacramento (California) National Wildlife Refuge below, are still impressive, drainage has cut the wetland area to about 75 million acres. Each year, several hundred thousand additional acres are converted to something else.



PAINTING BY WALTER A. WEBER, NATIONAL GEOGRAPHIC STAFF

The National Park Portion of the Everglades Provides Limpkin, Alligator, and Gallinule a Haven Unspoiled by Man

UMI

DRAINING EVERGLADES UPSETS WATER BALANCE

AN IMPRESSIVE lesson in the misuse of wetlands is the Everglades.

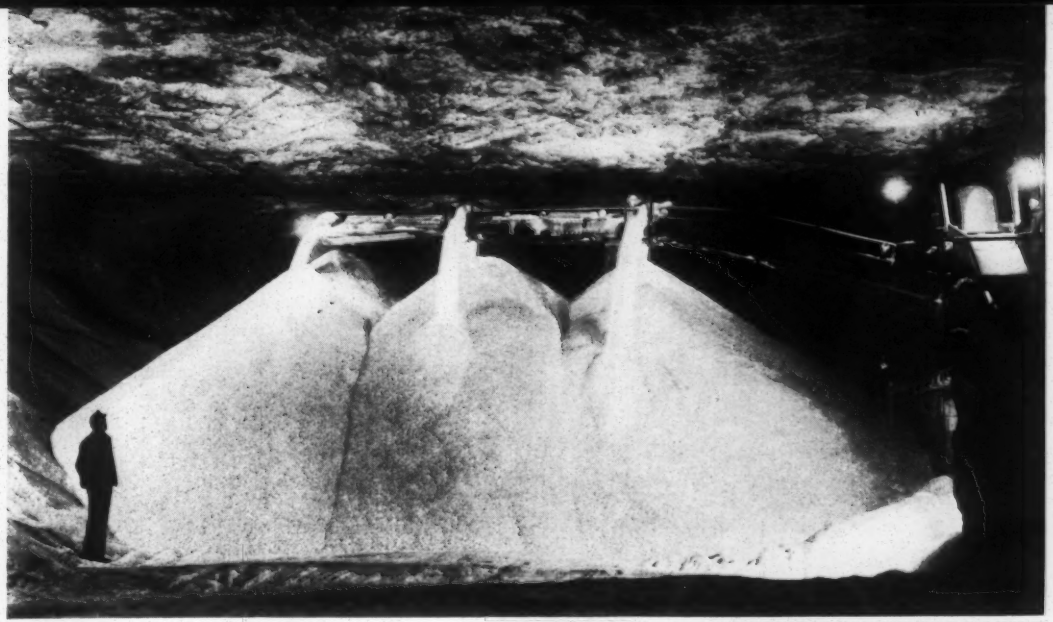
Swamp and marsh make up most of the southern tip of Florida, leaving higher land along the coasts for such cities as Miami and Naples. Not content to harvest the aged cypress trees (left), men coveted the rich black muck for farming. They tried to drain a large section—and succeeded too well.

After the surface water was drained off, fresh water beneath the ground was unable to hold its position against the pushing sea. Salt water edged into the subsoil to ruin city and farm wells.

Further, no allowance was made for the area's violent droughts and floods. When dry times came, the canals carried off what water there was—leaving the peaty soil to dry in the sun, burn, and disappear forever.

Floods followed, overwhelming the drainage system and destroying the crops. The Army Corps of Engineers was forced to draw up a plan whereby large sections of the 'Glades would be returned to their natural wet condition —regardless of how tempting the rich soil seems to farmers.

WILLARD R. CULVER



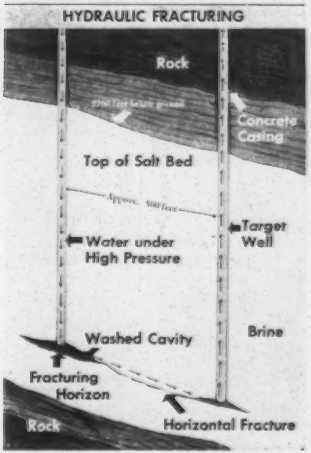
ILLUSTRATIONS FROM INTERNATIONAL SALT COMPANY

EARLY SETTLERS in the United States stocked up from natural salt springs called "licks." More recently man has learned how to tap underground reservoirs of brine. Today the 24 million tons of salt used yearly come largely from mining and hydraulic drilling methods.

Working hundreds of feet below the ground, the miners at left bore ten-foot holes into the rock salt face above a horizontal slit. Into each hole they tamp a charge of dynamite. The detonation rips out great chunks. Crushed and screened, rock salt above cascades from a moving belt into piles in a mined-out portion of the International Salt Company's Detroit mine. Michigan, New York, Ohio, and Louisiana rank as top salt-producing States.

Table salt represents only four percent of U. S. production. The chemical industry alone lists 14,000 uses for sodium chloride, the chemical name for salt. Packers cure meat, tanners cure hides with it. Cities spread it on icy streets. Salt softens water, sets colors in fabrics, and solidifies soap. Big pinches go into the manufacture of gasoline, rubber, explosives, glass. Farmers set out blocks of salt in the fields for livestock. A.P.M.

HYDRAULIC drilling has tapped underground seas of brine. To start a salt well, drillers drive twin pipes, several hundred feet apart, into a salt vein. Water is pumped down one under tremendous pressure. It blasts out a watery pocket, forces its way along the stratum. When it reaches the target well, the pressure pushes the concentrated brine to the surface. The flow soon eats a tunnel between wells, pressure is reduced, and the brine flows steadily.

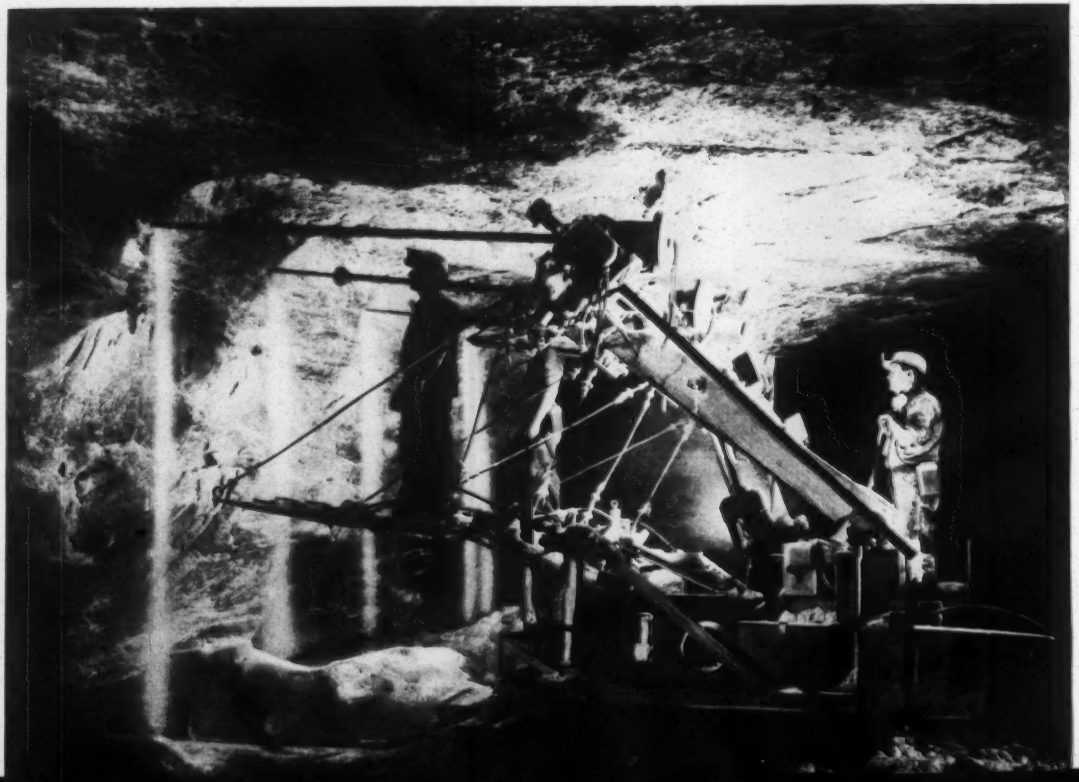


New Methods Tap Salt of the Earth

Chemical Industry Stirs in Biggest Pinch of Once-Scarce 'Magic White Sand'

ACME

MANY A Japanese villager still depends on the ocean for his salt. From a bucketful of sea water, he may evaporate a meager handful. Salt has been in short supply in other places and at other times as well. American Indians fought for possession of the "magic white sand." Roman soldiers got a special stipend to buy their ration of salt. Their word for it, *salarium*, evolved into our word *salary*.



towering, forested Wasatch Range splits the clouds at the eastern edge of the narrow valley and sends many streams tumbling down to water Utah's large cities and principal farming region.

Salt Lake City makes a show of plentiful fresh water in desert surroundings by letting it course wantonly along street gutters. Trees flourish and green grass grows all around this stately capital city and world religious center of Mormonism. A different view confronted the Mormons in 1847. They looked down from Emigration Canyon and saw one lone tree struggling for survival on the sun-baked flats below. With faith in God and his intrepid people, Brigham Young, their leader, nevertheless said, "This is the place."

They dug irrigation ditches and planted 5,000 acres of grain. As the crop ripened a scourge of crickets began devouring the grain. When all seemed lost flocks of sea gulls flew in from the west and feasted on the crickets. A large part of the crop was saved and the colony's life assured.

RALPH GRAY (ABOVE); HOWELL WALKER, NATIONAL GEOGRAPHIC STAFF

In Temple Square, a 10-acre haven of repose in the center of Salt Lake City, the grateful Mormons erected the famous Sea Gull Monument (above). Behind it rises the Temple (left), a magnificent structure viewed by a million sightseers a year. R.G.

UMI

DAVID S. BOYER, NATIONAL GEOGRAPHIC STAFF

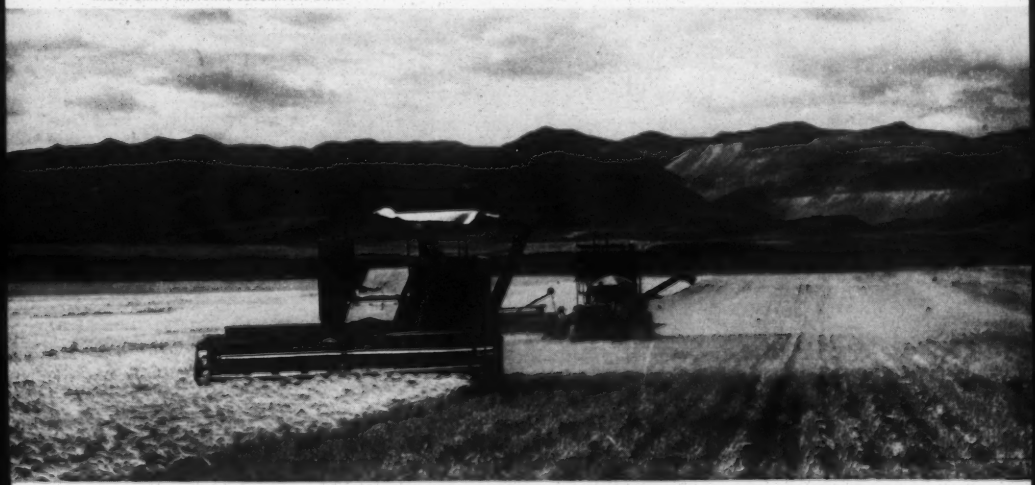
CITIES, FARMS EDGE GREAT SALT LAKE

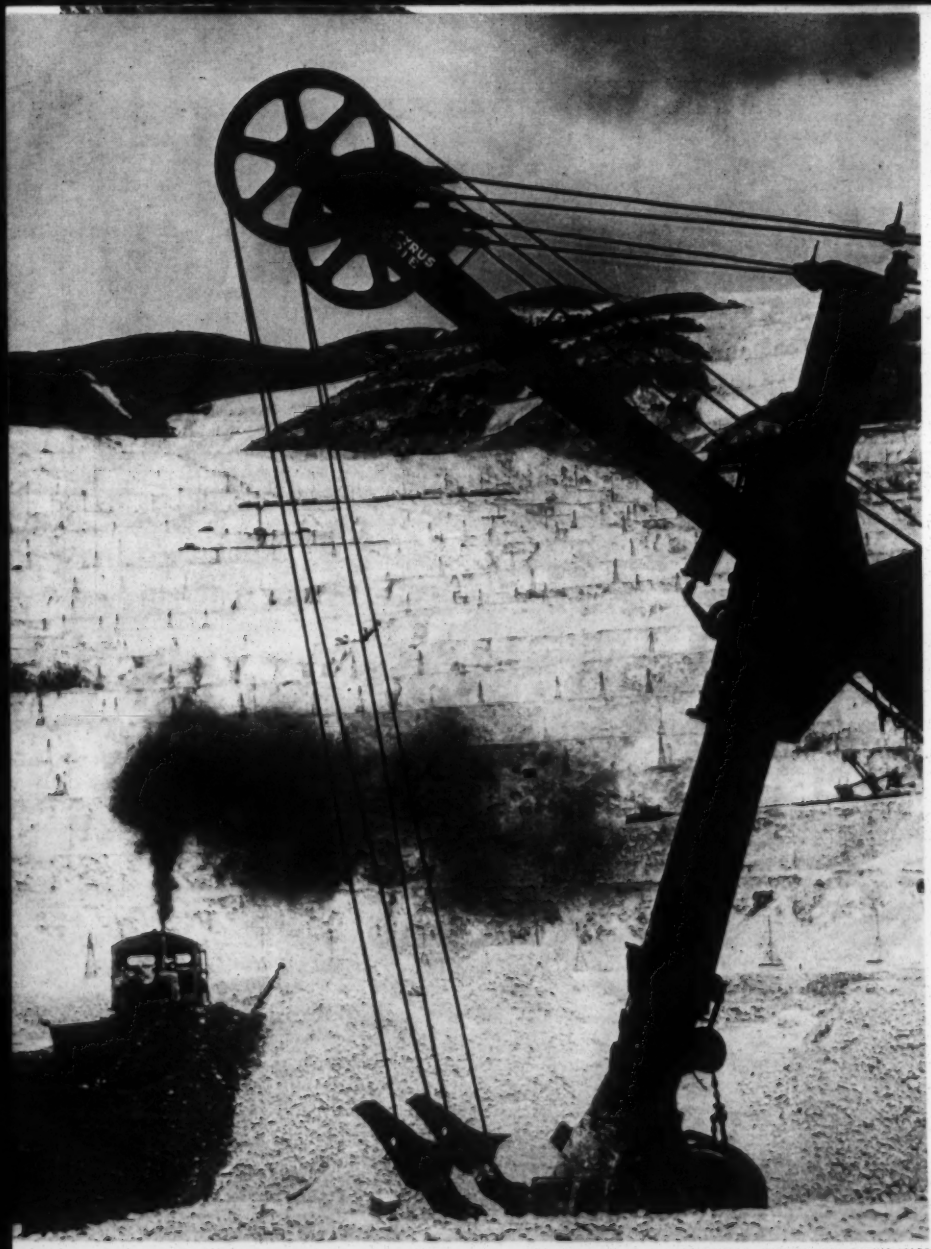
GREAT SALT LAKE is so salty (usually about six times as saline as the ocean) that it not only easily floats the card table (above) but the players as well. Visitors in Utah flock to this natural wonder to test what they've heard from childhood—that it's impossible to sink in these waters. It is true; if you floated beyond help's reach you'd starve to death before drowning.

One swim a lifetime in Great Salt Lake is enough for the average traveler. The bitter water stings the eyes and nose, cakes the hair, and rimes the body with dried salt as you hurry back to shower in your Salt Lake City motel, 16 miles east. Along the way you pass shallow evaporation ponds where lake water dries. Reclaiming salt in this manner makes an important local enterprise.

Not far from the lake's blistered shore line blooms one of the West's garden spots. The vast wheat field below stretches toward the Oquirrh Mountains, a grim rib of upthrust rock that ends at the lake 13 miles north (above). The

RALPH GRAY, NATIONAL GEOGRAPHIC STAFF





RALPH GRAY, NATIONAL GEOGRAPHIC STAFF

SHOVELS BITE DEEP in Utah's mineral-rich mountains, bringing up wealth the Mormon pioneers never dreamed of, and did not want. Brigham Young said, "We cannot eat gold and silver," but today Utah is second on the list of States producing nonferrous metals. One mine, Bingham Canyon (above), accounts for a large portion of the nation's copper and more than half the State's gold. This largest opencut copper mine in North America is shaped like an inverted beehive, with 20 or more terraces rising in ever-widening circles from the bottom. An electrified rail line follows the terraces, and three trains are seen carrying ore to the top. Much of it is smelted near by on the shores of Great Salt Lake.

UMI